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The Java automotive industry: between Keiretsu and Learning Region

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Abstract: This paper discusses two models for economic development of the automotive industry in the Indonesian Jabotabek region. The Keiretsu model combines access to Japanese knowledge with dependence on Japanese MNEs. To become less vulnerable in the global economy, the region needs to develop a capacity for indigenous growth based on interactive learning between regional firms. This corresponds to the Learning Region model. However, the hierarchical nature of the Keiretsu networks and the dependence of Indonesian firms on Japanese MNEs challenge the feasibility of this strategy. The paper thus raises the questions of the applicability of the Learning Region for developing economies.

Keywords: Keiretsu; Learning Region; regional economic development; automotive industry; innovation.

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1 Introduction

The Java automotive industry is one of the drivers of the developing Indonesian economy. The industry is predominantly clustered in the Jabotabek region of West Java, which corresponds to the provinces of Jawa Barat and DKI Jakarta. The industry is heavily dominated by Japanese automotive firms. US and European carmakers play a marginal role at best. Six Japanese brands have a market share of just under 90% in Indonesia.[1] Consequently, Japanese carmakers were able to impose their traditional *Keiretsu* system as the basis for the Indonesian automotive industry. The Keiretsu brings with it a model of economic development that follows hierarchical lines based on Foreign Direct Investment (FDI) from the Japanese parent companies. Evidence of this development model is abundantly present in the Indonesian automotive industry from the 1970s onwards. More recently, however, the Indonesian government has tried to further the economic development of the Jabotabek region based on strengthening the local Indonesian automotive firms; a development model that bears some resemblance to the Learning Region. This results a tension in the Indonesian automotive industry between, on the one hand, the top-down development strategy of the Keiretsu and, on the other hand, the indigenous growth development strategy of the Learning Region.

In today's knowledge-based economy, economic development of firms and regions alike depends on the creation, dissemination and application of knowledge in new or improved products, services and processes (Rutten, 2003; Morgan, 2004). The above models of economic development reflect two very different ways of initiating knowledge creation, dissemination and application in a region. The Keiretsu model is a model where knowledge developed outside the region gets transferred to regional firms through FDI. This model can give a region quick and easy access to knowledge; however, it does little to further regional knowledge production. Yet the capacity for indigenous knowledge production is deemed vital for regional economic development in the economic geography literature (Boschma, 2004; Morgan, 2004; Lorenzen, 2008). Developing a regional knowledge production capacity as the basis of regional economic development is the aim of the Learning Region (Morgan, 1997; Rutten and Boekema, 2007a). Learning Regions have the capacity to generate indigenous growth, that is economic growth based on the skills and competences (i.e. knowledge) of its own firms. Regional networks of firms and their connections to knowledge centres are at the heart of a Learning Region's capacity for indigenous growth. But also its capacity for institutional learning and resulting regional development policies are a crucial element of a Learning Region (Morgan, 1997; Hudson, 1999; Rutten and Boekema, 2007a). Obviously, the more developed the regional networks and capacity for institutional learning, the better the prospects for indigenous regional development. The problem for a developing economy such as Indonesia is that it falls short on precisely those characteristics, compared to developed economies. Therein lies the above-mentioned tension.

This paper explores the strengths and weaknesses of the two development models for the automotive industry in the Jabotabek region, taking into account the nature of this region as a developing economy. The remainder of this section discusses some key figures on the Indonesian automotive industry. The next section discusses how the Japanese Keiretsu system has been helpful in furthering economic development in the Indonesian automotive industry, but how it also hampers further development. The two

following sections discuss the difficulties that the Jabotabek region faces regarding the adoption of a Learning Region based development model. The final section summarises the key arguments of this paper and presents a conclusion regarding the Learning Region as a development model for the automotive industry in the Jabotabek region.

The growth of the automotive industry in the Jabotabek region is largely based on the growth of domestic demand for motor vehicles. This growth has been considerable in the 1990s and 2000s because of Indonesia's rising standard of living, but it is also vulnerable to international economic developments, such as the most recent economic crisis that originated in the USA in 2008. As a result of this crisis, the Indonesian market for motor vehicles decreased from 603,774 units in 2008 to 483,548 units in 2009. Similar drops were observed in other ASEAN countries, to which Indonesia exports automotive parts and subassemblies, and Indonesia's share in the ASEAN automotive market dropped from 28.6% in 2008 to 25.4% in 2009, thus nullifying the steady growth of market share in previous years (26.0% in 2005).[2] This downfall strengthened the commitment of the Indonesian government to its policy of indigenous development of the automotive industry (MOSR, 2002; MOTIRI, 2005). The importance of the automotive industry for Indonesia is substantial. Between 2005 and 2008 employment in this sector more than doubled. By comparison, employment in total manufacturing 'only' doubled while total employment grew just under 60%. These growth rates, of course, reflect the developing nature of the Indonesian economy. Employment in the automotive industry is 8% of manufacturing employment and 6.4% of total employment (see www.oica.net/category/economic-contributions/auto-jobs/). According to the OICA website (International Organization of Motor Vehicle Manufacturers), Indonesia counts some 64,000 auto jobs (figures for 2007) (see www.oica.net/category/economic-contributions/auto-jobs/). Indonesian figures, unfortunately, are somewhat ambiguous. Jawa Barat and DKI Jakarta seem to be the only two provinces that report establishments and employment in the automotive industry. The total number of employees in this sector for both regions totals 55,672 in 2005. However, DKI Jakarta reports figures for medium and large enterprises only, while Jawa Barat seems to include figures from small companies as well. National data report that Indonesia counted 262 establishments in the automotive industry in 2005. The combined figures for Jawa Barat and DKI Jakarta total 163, but again, small firms seem to be omitted from the Jakarta data (see Table 1). The conclusion thus seems justified that the Indonesian automotive industry is an (almost) exclusively Jabotabek region affair. Therefore, in this paper the 'Indonesian automotive industry' is synonymous with the 'automotive industry in the Jabotabek region'.

Table 1 Motor vehicles, trailers and semi-trailers industry in Jabotabek and Indonesia (2005)

	Jawa Barat	*DKI Jakarta*	*Jabotabek Region*[a]	*Indonesia*
Employment	29,137	26,535	55,672	64,000[b]
Establishments	128	35[c]	163[c]	262

Notes: [a]Jabotabek = Jawa Barat + DKI Jakarta; [b]OICA figure for 2007; [c]DKI Jakarta figure is exclusive small enterprises.

Sources: Statistics Indonesia, Statistics Jakarta, Badan Pusat Statistik Provinsi Jawa Barat, OICA (see also www.dds.bps.go.id)

2 The Japanese Keiretsu: top-down development

The Keiretsu is the traditional business model of the Japanese manufacturing industry. It is basically a system of vertical integration through long-term supplier networks and shared network norms. The Keiretsu model ensures top-down control over the network for the network's dominant manufacturer. The Keiretsu was designed for lean production, that is efficiency, and it lacks decentralised and diffused design capabilities (Gerlach, 1992; Best, 2001). In this paper, Keiretsu refers to the Japanese-led networks in the Indonesian automotive industry. The various Japanese carmakers in Indonesia, such as Toyota, Nissan and Mitsubishi, each have their own Keiretsu of tightly controlled vertical networks of Indonesian suppliers and subcontractors, and these firms are not likely to work for companies outside their own Keiretsu (Irawati, 2009). Originally confined to the Japanese mainland, the carmakers have expended their Keiretsu to included subcontractors elsewhere in Southeast Asia from the 1970s onwards. Initially, the internationalisation of the Keiretsu was intended as a cost-cutting strategy to benefit from low-cost manufacturers in the developing economies of Southeast Asia. Currently, Keiretsu development follows a more knowledge-based approach (Irawati and Charles, 2010).

From a theoretical perspective, the Keiretsu may be seen as an example of network governance, where the network is viewed as a mechanism of coordination (Provan and Kenis, 2008). The key benefit of network governance compared to markets or hierarchies is that networks simultaneously allow for flexibility and control (Piore and Sable, 1984; Larson, 1992). Networks are a form of social organisation and they vary greatly with regard to their structural pattern of relations (Provan and Kenis, 2008), and different types of networks emphasise different forms of governance (Uzzi, 1997). The Keiretsu is an example of lead-organisation governance and is characterised by centralised decision-making and asymmetrical power relations (Best, 2001; Irawati, 2009). Network relations are predominantly top-down with the lead organisation, in this case, the Japanese carmaker clearly being the hub in the network. Lower order network members have few direct relations. Instead, they communicate through higher order brokers. The hierarchical nature of this type of network reduces the need to develop network-level competences. An important coordination mechanism in this type of network follows from the dependency of the network members on the lead organisation. Loyalty becomes more important than trust and goal consensus (Best, 1990; Gerlach, 1992; Gerlach and Lincoln, 1992; Provan and Kenis, 2008). For Japanese carmakers, the Keiretsu is a means to reduce several kinds of uncertainties by creating a hierarchical network of subsidiaries, subcontractors and suppliers around them, while at the same time, staying firmly in control. This is a key difference between the Japanese automotive industry, on the one hand, and its US and European counterparts, on the other hand, where horizontal network relations play a far more dominant role (Best, 1990; Gerlach and Lincoln, 1992; Best, 2001).

The benefits of this strategy for the Japanese carmakers are clear. It allows them to spread the costs and risks of doing business in a highly competitive and uncertain world (Gwyne, 1990; Gerlach and Lincoln, 1992; Hatch and Yamamura, 1996; Ozawa, 2005). Subordinate firms, in turn, receive access to capital, technology, managerial know-how and markets through their liaison with the large maker. The key incentive for smaller firms to become part of a Keiretsu lies in the long-term nature of Keiretsu relations, which offers them much more certainty than market relations do. The Keiretsu, thus,

enables subordinate firms to upgrade their performance levels, which in turn benefits the lead firm. The international expansion of the Keiretsu follows the Japanese 'flying geese paradigm', where economically disparate regions achieve complementarities or divisions of labour (Ozawa, 2005). Initially Southeast Asian Keiretsu members performed the role of low-cost producers, but their gradually upgraded performances levels now allow them to play more sophisticated roles as well. This is also the case in the Indonesian automotive industry. From the 1990s onward, the Jabotabek region has developed from a 'workbench' for the Japanese carmakers to a regional production centre which exports to other countries in Southeast Asia, the Middle East and Latin America. Nonetheless, Japanese domination of the Indonesia automotive industry is a strong as ever. For example, the Keiretsu have "established a partially internalized market for intermediate products" (Gerlach and Lincoln, 1992, p.493), which results in stable, long-term network relations (Hatch and Yamamura, 1996; Ozawa, 2005). The price for this stability is Japanese dominance of the Indonesian firms. This domination, or vertical quasi-integration, of the Keiretsu does preclude competition, though. On the one hand, there is rivalry between the Indonesian automotive firms within the semi-internalised markets of their Keiretsu. On the other hand, the Jabotabek region competes with other automotive industry regions in Southeast Asia (Ernst, 1994; Gereffi et al., 2005; Fujimoto, 2007; Irawati and Charles, 2010).

The key to understanding Japanese domination of the Indonesian automotive industry lies in the development path followed by the Japanese carmakers, which resulted in their technological and managerial knowledge becoming pivotal in their respective Keiretsu. Initially, in the 1970s and 1980s, Japanese carmakers established transplants in the Jabotabek region, that is companies owned and managed by their Japanese parent companies and employing production technology transferred from the parent companies. The transplants served as 'workbenches' for their parent companies, which achieved cost benefits in return (Ozawa, 2005; Irawati, 2009). In the following stages, Japanese carmakers started to outsource production to local subsidiaries and subcontractors. In order to bring these Indonesian companies up to Japanese standards, these local firms received managerial, organisational and technological knowledge transfer from the Japanese carmakers (Irawati and Charles, 2010). The knowledge transfer from the Japanese carmakers comes with long-term commitments that effectively incorporate the local firms into the Keiretsu of 'their' respective carmakers. The resulting dependency of the Indonesian firms on their Japanese 'bosses' can hardly be underestimated (Sato, 2001). Technologically they are committed to use precisely calibrated tools and dies for the production of the parts and subassemblies that their carmaker has outsourced to them. To operate this often sophisticated equipment, the Indonesian firms have to make substantial investments in highly specific job training programmes for their employees (Hatch and Yamamura, 1996; Pries and Schweer, 2004; Irawati, 2009). The resulting asset specificity and sunk costs for the subordinate Indonesian firms make it increasingly unattractive for them to work for other MNEs or even to shirk or exert less than the maximum effort in order not to jeopardise the relationship with their Japanese 'parent'. Upsetting the Japanese 'parent' brings the real danger that the relationship will be terminated which will drastically reduce the value of the investments and the assets of local Indonesian firm (Doner, 1991; Chen, 1996; Hatch and Yamamura, 1996; Honda, 2004; Toyota, 2007). Also the aspect of loyalty needs to be considered as a part of the Keiretsu relations. Loyalty plays a different role in an Asian context than it does in a Western context (Gerlach and Lincoln, 1992) and it is yet another mechanism through

which Japanese carmakers can exercise control over their Indonesian subordinates. It is a far more subtle but therefore no less effective control mechanism than organisational, managerial, technological and legal control mechanisms. Western firms are uncomfortable in a business regime that runs so much on long-standing personal relationships rather than on clearly established legal guidelines (Best, 1990; Gerlach, 1992; Chen, 1996; Uzzi, 1997). The resulting coordinated deployment of resources in the Keiretsu, in particular, managerial and technological knowledge transfer allows the parent firm to capture more firmly the gains from its resources. Knowledge spillovers are largely intentional and internal to the Keiretsu. Knowledge spillovers outside the Keiretsu are far less frequent compared to the less hierarchical networks of US and European carmakers (Busser and Sadoi, 2004). Production alliances in the Keiretsu are also far more exclusionary than those in US and European automotive networks. In combination with importance of personal relations, it makes Southeast Asia a difficult to penetrate market for US and European carmakers, rendering Japan a heavily dominant position in this part of the world.

In general, the benefits from the Keiretsu that have accrued to Indonesian firms and the Jabotabek region are substantial. In the first place, the movement of the Japanese carmakers into the Indonesian automotive industry has resulted in a considerable direct and indirect job growth. The automotive companies in the Jabotabek region have seen their employment levels increase since the 1970s, and many new companies have been established in this industry. In turn, this has triggered employment growth in other sectors in the Jabotabek region as well. The automotive industry is now one of the economic pillars of this region (MOSR, 2002; MOTIRI, 2005). Second, the Japanese FDI have exposed the region to new technologies and innovation in the automotive industry, which has hastened the catching-up process of this developing economy (Irawati and Charles, 2010). The capacity for indigenous growth, although heavily path-dependent on Japanese carmakers and their organisational, managerial and technological knowledge, is much greater than it would otherwise have been (Rasiah, 2005). Third, the acquiring of products from indigenous firms by Japanese automotive affiliates has increased the sales and innovation of these indigenous firms. In other words, the downward linkages have produced considerable economic gains that have benefited not only suppliers in the automotive industry, but also related industries and the wider regional economy (Rasiah, 2005).

In sum, the Indonesian automotive industry and in its wake the Jabotabek region have developed favourably under the wings of the Japanese Keiretsu. The automotive firms in this region are increasingly capable of producing complex parts and subassemblies, which give them a better competitive edge compared to their counterparts elsewhere in Southeast Asia. The Jabotabek region now exports parts and subassemblies to other Japanese-controlled automotive regions in Southeast Asia, and ties are starting to form between Indonesian subcontracts to work on product development and innovation, albeit within the context of the export and innovation needs of their Keiretsu. Consequently, the Indonesian automotive industry can function as an engine, transforming the low-wage, labour-intensive, inward-looking economy of the Jabotabek region in a higher wage, technology-intensive, export-oriented economy. However, it comes at a price. The Keiretsu model has a negative impact on the development of local linkages which stifles local initiatives and the potential for indigenous growth. Moreover, the Indonesian automotive industry is vulnerable to international demand and supply conditions, and on Japanese response to them.

3 Regional economic development of the Jabotabek region

The world financial crisis that started in 2008 is not the first to affect the Indonesian automotive industry. Following the Asian financial crisis some ten years earlier, the Indonesian government initiated its 'Industrial Growth 2025' programme, which aims to establish high-tech industry as prime mover of the national economy. The automotive industry was heavily targeted in this programme, which resulted in the establishing of an industrial district in the Jabotabek region (MOSR, 2002; MOTIRI, 2005; Irawati, 2009). The industrial district should provide the necessary physical and knowledge infrastructure, research centres and intermediary services in a one location at reasonable costs. Following 1989 regulations, automotive companies must now locate in selected industrial estates across Java, and the Jabotabek region has been by far their most popular region of choice. The clustering of automotive companies in this region has facilitated the growth of a network of support activities, such as knowledge centres, intermediary organisations, government agencies and financial services. The clustering of automotive firms in this region also allows them to reap the benefits of spatial proximity with regard to knowledge exchange, trust-building and the development of shared norms and customs that facilitate social and business interaction (Morgan, 2004; DuPuy and Torre, 2006). The Jabotabek region thus seems to have the critical mass that is necessary if an industry is to carry regional economic development (Lagendijk and Charles, 1999; Gertler and Wolfe, 2006). The scale of the Indonesian automotive industry is the first element of the critical mass. During the 2000s, Indonesia has developed into a substantial player in Southeast Asia. Second, the number of firms in this sector is very substantial and encourages competition, particularly between Small and Medium-Sized Enterprises (SMEs) who form the supplier base. Third, development and dissemination of technology and innovations goes faster in larger clusters of firms as R&D funding and absorptive capacity are larger. Finally, networking is easier in larger clusters of firms since the changes of finding competent complementary partners are greater (Porter, 1990; Lazerson and Lorenzoni, 1999; Boschma, 2004; Irawati and Charles, 2010).

The key challenge for attempts at furthering indigenous growth lies in the forging of links between firms of different Keiretsu. Although links between Keiretsu members (internal links) are well developed, the very nature of the Keiretsu makes that links between them (external links) are scarce (Gerlach, 1992; Irawati and Charles, 2010). The effort of the Indonesian government is aimed at creating these external links, between firms but also between firms and a range of heterogeneous agents in the regional knowledge infrastructure. This would strengthen the organising capacity of the region, which may be defined as the ability of a region to enlist all regional actors in idea generation and policy implementation for sustained economic regional development (Lazerson and Lorenzoni, 1999). The strong focus on internal links and the weak development of external links render the organisational capacity of the region underdeveloped. Given the preoccupation of the leading Japanese firms with their respective Keiretsu, the Indonesian government now sees a need to act as network broker to bring people and firms together (MOSR, 2002; MOTIRI, 2005). It has encouraged the Indonesian government to assume roles that include not only traditional government policy but also those usually performed by the private sector. For example, the Indonesian government not only uses tax incentives, credit provision and set-up and R&D infrastructure, but it also actively tries to establish subcontractor partnerships, and is involved in efforts to strengthen productivity and product quality of local manufacturing firms and furthering exports of these firms (Irawati, 2009).

4 The Learning Region model

The Learning Region is one of several TIMs that aim to explain the relation between networks, learning and spatial proximity. Because the Learning Region has a stronger link to innovation policy than other TIMs (Hassink, 2001), we choose it to assess the efforts of the Indonesian government to initiate indigenous growth. More so than other TIMs, the Learning Region connects "the concepts of the network approach … – like interactive innovation and social capital – to the problems of regional development" (Morgan, 1997, p.492). However, the subsequent conclusion that interactive creation of (tacit) knowledge in regional networks is the key to regional economic development is shared by the other TIMs (Oerlemans et al., 2007). In the words of Lorenzen, TIMs "share a vision of (small) firms as dependent of support from the region, in relation to extra-regional knowledge sourcing. The region is understood largely as local networks and institutions. The global scale is seen as inaccessible for small firms, and without the region they would not be able to innovate and compete in the global economy. In this way, the region is seen as determining the development, innovation and competitiveness of firms" (Lorenzen, 2008, p.540). Although the Learning Region is more of a theoretical construct than something that is actually observed (Boekema et al., 2000), it offers an analytical tool to explain the potential for economic development of a region based on its capacity for learning and innovation. The more a region conforms to the theoretical construct, the better its perspectives for indigenous economic development. This section identifies the key analytical characteristics of the Learning Region.

The Learning Region, like other TIMs, stresses that "regional economic success is heavily based upon territorially defined assets derived from 'unique', often tacit, knowledge and competitive assets, and stresses the importance of spatial proximity in collective learning processes" (Hudson, 1999). Consensus in the literature on a definition of the Learning Region is limited to this general level (cf. Morgan, 1997; Hassink, 2001; Rutten and Boekema, 2007a). When it comes to actually identifying the characteristics of a Learning Region, the task becomes more challenging and it may be difficult to distinguish the Learning Region from other TIMs (Rutten and Boekema, 2011). Consequently, the Learning Region is often described in terms of an ideal type, which, in turn, has led to the criticism that it is a normative concept (Hassink, 2001). Rutten and Boekema (2007b, p.138) identify three key characteristics of the Learning Region, that is spatial proximity, regional interfirm networks and the regional institutional set-up. Based on Hassink (2001) a fourth characteristic may be added to this list, regional innovation policy, since the Learning Region has a more intimate association with policy than other TIMs (Morgan, 1997; Hassink, 2001; Rutten and Boekema, 2011). In an ideal typical Learning Region these characteristics would be met in the following way. Spatial proximity refers to both 'traditional' agglomeration advantages and to the importance of spatial proximity for collective learning. This means that a Learning Region has a substantial concentration of economic activities to produce externalities (i.e. traditional agglomeration advantages). In addition, frequent interaction between co-located economic agents creates shared norms that may facilitate collective learning (Morgan, 2004). The regional interfirm networks characteristic refers to both the structure and the nature of regional networks. Regional networks in a Learning Region are extensive in that they include many regional actors, such as firms, knowledge centres and intermediary organisations, and that they are also linked to actors outside the region (the structure of the networks). But, regarding to their nature, regional networks are also flat

and flexible rather than hierarchical and exclusive, since that is most conducive to interactive learning (Uzzi, 1997; Hudson, 1999; Lazerson and Lorenzoni, 1999; Rutten and Boekema, 2007b). The institutional set-up of a region refers to the presence of public and private research centres and the presence of intermediary organisations who can act as knowledge brokers between knowledge centres on the one hand and the regional business community on the other hand (Morgan, 1997). Not only does a Learning Region count a variety of high-level knowledge centres but they are also well-connected to the regional business community, if necessary through the help of intermediary organisations. The final characteristic, regional innovation policy also consists of two elements. Not only has a Learning Region a policy to further innovation among regional firms based on what Hudson (1999) calls its territorial assets, it also has a capacity for institutional learning. That is regional actors, such as government, the business community, knowledge centres and intermediary organisation, form a network that develops a strategy for regional innovation and development (Hassink, 2001). In a Learning Region, the regional actors have the capacity to revise this strategy to changing needs and demands (Morgan, 1997).

The above characteristics apply to the Jabotabek region in varying degrees. The region has definitive potential to benefit from traditional agglomeration advantages, considering the substantial number of firms and other economic agents it hosts. In fact, Indonesian government policy to cluster automotive companies on specific industrial estates in the region was partially motivated by the promises of agglomeration advantages. The spatial clustering makes the services provided by research and vocational education centres, financial institutions, etc. more efficient (Irawati, 2009). Spatial proximity also facilitates collective learning in the Jabotabek region. The long-term relations in the Japanese Keiretsu have a distinct personal element, and spatial proximity made it easier to maintain close personal relations between the various firms, which contributed to the substantial level of trust and knowledge exchange in these relations (Irawati, 2009). The network characteristics of the Jabotabek region have been discussed in detail earlier in this paper. The structure of the networks is one of dense linkages within the various Keiretsu in the region (the internal linkages), but few linkages between them (the external linkages). The nature of these networks is basically hierarchical in that the Japanese carmakers exercise considerable formal and informal control over the Keiretsu members and that knowledge flows are mainly top-down (Irawati, 2009; Irawati and Charles, 2010). In other words, the networks in the Jabotabek region are only partially developed and hence do not provide a good basis for indigenous regional development as advocated by the Learning Region.

Regarding its institutional set-up, the region hosts several knowledge centres that specialise in automotive-related knowledge (see Table 2). Although their level of knowledge is generally good, their connections to the automotive industry are sparse. The main reason for this, of course, being the emphasis on Japanese knowledge and its top-down dissemination through the Keiretsu. This goes for technology development as well as vocational education. As a result, the Jabotabek knowledge centres are involved in only a handful of knowledge creation and innovation projects in the automotive industry (Irawati and Charles, 2010). The situation with regard to the intermediary organisations is somewhat better in so far that the automotive industry has organised itself in Gaikindo (The Association of Indonesia Automotive Industries). According to their website, Gaikindo's mission is "To become a world-class, professional and independent automotive organization, which plays an active role as the government's

equal partner in developing the industry to be adept at competing in the international market" (www.gaikindo.or.id). Gaikindo membership, though, is made up mainly of Indonesian subsidiaries and branch plants of the Japanese, European and US carmakers. Gaikindo is certainly a valuable instrument to further the interests of the Indonesian automotive industry, both domestically and in the ASEAN region but its power vis-à-vis the Keiretsu is limited (Irawati and Charles, 2010). Other intermediary organisations, such as financial organisations, engineering bureaus, innovation relay centres, are available in the Jabotabek region, but their success is limited. The explanation for this is not unique to Indonesia; instead, it troubles intermediary organisations all over the world. Those firms that can potentially benefit most from the services of intermediary organisation are often not sufficiently developed to clearly articulate their knowledge needs to the intermediary organisations. These firms are the so-called 'jobbers', who basically limit themselves to working on demand as subcontractors for larger firms. They have little or no engineering capacity of their own and must work according to specifications and blueprints provided to them by their clients (Rutten, 2003). Given that Indonesia is a developing economy, the proportion of jobbers is higher than in, for example Europe and North America. This makes the model adopted by many European regions to further knowledge dissemination among regional SMEs less feasible for Indonesia. In many European regions, networks were forged between intermediary organisations and manufacturing SMEs working as suppliers for large companies, as part of their regional innovation strategies. These networks are particularly helpful for the dissemination of managerial knowledge and they facilitate collective learning among SMEs with the intermediary organisations acting as 'connectors'. However, the European SMEs involved in these networks are usually beyond the level of a jobber (Morgan, 1997; Morgan and Nauwelaers, 2003). An additional difficulty for the intermediary organisations is that they have to compete with the Japanese carmakers, which makes the forging of regional networks difficult, since the Japanese carmakers prefer to keep SME networks limited their respective Keiretsu (Irawati, 2009).

Table 2 Automotive knowledge centres in the Jabotabek region

Knowledge Centre	*Location*
University of Indonesia	Jakarta
ITB (Institute of Technology Bandung)	Bandung
Polman Astra-Automotive Polytechnic	Jakarta
LIPI (The Indonesian Institute of Sciences)	Jakarta
BPPT (Agency for the Assessment and Application of Technology)	Jakarta
BTC (Business Technology Centre)	Jakarta

Source: Authors' research

On the final characteristics, regional innovation policy, the Jabotabek region is found to have a clear and well-defined innovation strategy. Strictly speaking, this is more a national than a regional innovation strategy. However, the Indonesian national government designed this strategy specifically for the automotive industry in the Jabotabek region. This is different compared to regional innovation strategies in Europe, which are almost exclusively developed by regional governments (or administrators). The idea behind this is that regional governments are much more familiar with the specific needs, challenges and opportunities of their region (Morgan and Nauwelaers,

2003). However, the competence level of European regional governments is comparable to that of their national governments, something that may not be the case in developing economies (Gwyne, 1990). The national-driven innovation strategy for the Jabotabek region may thus benefit from the competence level of the national government. Given also that the seat of the national government, Jakarta, is part of the Jabotabek region, government responsiveness to regional circumstances seems to be accounted for. Developing an institutional learning capacity for the automotive industry in the Jabotabek region may be more problematic given the position of the Japanese carmakers. They follow the interests of their respective Keiretsu first of all and seem to be in no hurry to develop a capacity for indigenous economic development (Irawati and Charles, 2010). Instead, the Japanese perspective on regional economic development is one of a division of labour between the various ASEAN regions where they have established their Keiretsu. In this perspective, the Japanese mainland regions are the forerunners and the various automotive regions in the ASEAN area the followers. Depending on their level of (technological) development, the various ASEAN regions have a more or less prominent place in the Japanese-led hierarchy. This enables the Japanese carmakers to allocate investments in those regions where it may contribute most to the overall benefit of their respective Keiretsu (Irawati, 2009; Irawati and Charles 2010). But it does not necessarily benefit the development of the individual regions. In fact, automotive industry in a region that has a potential for indigenous growth may be much harder to control since this industry has development options other than those under the Japanese umbrella. Consequently, those companies in the Jabotabek region that could potentially make a meaningful contribution to developing an institutional learning capacity may be less inclined to do so given their position in the Keiretsu system and the resulting loyalties to the Japanese carmakers.

Table 3 Learning region characteristics for the Jabotabek region

Spatial proximity	
Agglomeration advantages	Large number of firms in the region.
Collective learning	Regional networks insufficiently developed.
Network characteristics	
Network structure	Many linkages within the various Keiretsu, few linkages between them.
Nature of network relations	Network relations within the Keiretsu are hierarchical.
Regional institutional set-up	
Knowledge centres	Sufficiently present but servicing Keiretsu rather than regional development.
Intermediary organisations	Insufficiently networked to the region's SME.
Regional innovation policy	
Government policy	The region has a clear strategy for its automotive industry.
Institutional learning	The dominant Japanese carmakers follow their own interests first of all.

5 Summary and conclusion

The Jabotabek region seems to be at a crossroad in its economic development strategy. On the one hand, it is the top-down growth model of the Japanese Keiretsu, which offers access to much needed Japanese managerial and technological knowledge in return for a dependent position. On the other hand, it is the indigenous growth model of the Learning Region for which the region is probably not yet sufficiently developed. Given the status of Indonesia and Jabotabek as a developing economy, the Keiretsu strategy has been a very sensible catching-up strategy thus far. Because of it, the Jabotabek automotive industry transformed from a cheap labour industry to an internationally exporting industry. Trickle-down effects from the Japanese subsidiaries and branch plants to local Indonesian firms and the wider regional economy have contribute to job growth and economic development of the Jabotabek region. As argued, this strategy has serious downsides as well. The developmental interests of the Japanese carmakers are limited to their respective Keiretsu. This means that Indonesian firms play a specific role in the Japanese hierarchy and the knowledge that is disseminated to them is tailored to this role. However, a broader knowledge base is required for these companies to transform into Original Equipment Manufacturers (OEMs) or main suppliers that can play a more independent role. Moreover, knowledge spillovers largely remain limited to the companies directly involved in the Keiretsu. Even though job growth in these companies has wider beneficial effects in the regional economy, these effects will quickly evaporate in case the Keiretsu face economic difficulties. This became all too obvious in the downturn in the automotive industry in the mid 2000s. Therefore, an alternative regional economic development strategy needs to be implemented.

It is obvious, though, that the Jabotabek region is not (yet) a Learning Region and it is therefore questionable that the region be capable of indigenous economic development carried by Indonesian firms. In order to do so, the local firms must upgraded first. It is here that the Indonesian government can play an important role in forging temporary networks on innovation, such as product development, as European examples have show (Morgan, 1997; Lagendijk and Rutten, 2003; Morgan and Nauwelaers, 2003). Several European regions have been successful at initiating innovation projects for SMEs. The aim of these projects – which vary widely in scale and scope – is not only to development new products and thus strengthen the competitiveness of the SMEs involved but also, more importantly, to forge networks between SMEs and to teach SMEs new managerial skills that are needed to manage their network collaborations (Lagendijk and Rutten, 2003). In such a context of regional networks, it is more likely for SMEs to strengthen their technological competences. Government can attempt to forge SME networks through innovation projects by partially subsidising the costs involved. Innovation is risky and SMEs may not have the resources to carry that risk. Government subsidies may then be helpful. If research centres and larger companies can be involved in such projects it encourages knowledge transfer to SMEs. Additionally, the larger companies may be the buyers of the new products that the SMEs have developed. The larger companies can even participate in the product development. Examples of two successful such projects in the Netherlands are discussed by Rutten (2003) and Rutten and Oerlemans (2009). Such projects do not initially contribute much to the region as a whole. But if the Indonesian government were committed to a long-term development strategy, they could in this way help to create a number of more advanced SMEs in the Jabotabek automotive industry that are capable of conducting product development on their own. These companies, in turn, may be expected to form the nucleus for indigenous growth.

In sum, the most substantial obstacle against indigenous growth in the Indonesian automotive industry seems to be the lack of regional networks. Automotive firms are part of international Keiretsu rather than of a regional production system. Given the dependence of Indonesian firms on their Japanese patrons, they are not likely themselves to initiate a move towards indigenous development. The Indonesian government, based on a long-term policy, can transform the Jabotabek region into a Learning Region by forging innovation networks between regional SMEs and to link these networks to research centres and larger firms.

Moreover, this paper suggests that contrary to the TIM-argument, as summarised by Lorenzen (2008, p.540), regional SMEs may have an alternative to knowledge-based development, innovation and competitiveness in the form of FDI. In fact, given its current level of development a Learning Region strategy is not feasible for the Jabotabek automotive industry. Consequently, this may suggest that a Learning Region strategy requires a level of development that developing economies may not yet have reached. If that is true, it means that in the early stages of knowledge-based development, developing economies may not have a choice between FDI and indigenous growth strategies. Instead, they would be dependent on FDI for the transfer of knowledge to reach a threshold before they can embark on knowledge-based indigenous economic development strategies. As argued, this is at odds with the claim of the Learning Region and other TIMs that the interactive creation of tacit knowledge in regional networks is at the basis of knowledge-based economic development. This paper thus raises questions as to the applicability of the Learning Region and other TIMs in the context of developing economies. The paper suggests that FDI can be an alternative knowledge-based development strategy, albeit one with limitations in case knowledge-based development based on regional networks is not feasible. FDI may lead to path-dependent economic development based on foreign knowledge. The knowledge base thus acquired may not be broad enough to generate indigenous growth, and regions may find it difficult to broaden their knowledge base because of their dependency on foreign MNEs. Nonetheless, regional SMEs may still embark on a trajectory of knowledge-based development and strengthen their international competitiveness accordingly. After all, the Jabotabek firms have developed into suppliers of parts and subassemblies to other automotive regions in Southeast Asia. This potential limitation of the applicability of the Learning Region within the context of developing economies seems to have been overlooked in the literature, and it poses a challenge for the further development of this concept. Knowledge-based economic development of a region may be more complex than the Learning Region and other TIMs suggest. This paper points at the important role of extra-regional networks with regard to interactive learning and the problematic way in which the Learning Region and other TIMs have thus far dealt with them.

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Notes

1 According to data from Gaikindo (The Association of Indonesian Automotive Industries), Toyota, Daihatsu, Mitsubishi, Suzuki, Honda and Nissan had a market share of 89.3% in 2009 up from 88.4% in 2005.

2 Figures from the Indonesian Ministry of Industry.